



NATIONAL

Service Manual

ORDER NO. SDT-160

FET/SOLID STATE AM/FM MULTIPLEX STEREO RADIO-PHONO WITH SEPARATE SPEAKER SYSTEM

MODEL **SG-970A**



SPECIFICATIONS

Frequency Range: FM 87.5 ~ 108 MHz (3.43 ~ 2.78 m)
AM 525 ~ 1605 kHz (571 ~ 187 m)

Intermediate Frequency: FM 10.7 MHz
AM 455 kHz

Transistors:

2SK19	FM RF Amplifier (FET)
2SC920	FM Mixer
2SC829	FM Oscillator
2SC829	FM 1st IF Amplifier
2SC829	AM Converter
2SC829	FM 2nd IF Amp. & AM 1st IF Amp.
2SC829	FM 3rd IF Amp. & AM 2nd IF Amp.
2SC829	Distributor
2SC829	19 kHz Amplifier
2SA101	38 kHz Amplifier
2SC829	DC Amplifier
2SB178	DC Switching
2SA564	1st AF Amplifier (left)
2SA564	1st AF Amplifier (right)
2SB173	2nd AF Amplifier (left)
2SB173	2nd AF Amplifier (right)
2SB173	3rd AF Amplifier (left)
2SB173	3rd AF Amplifier (right)
2SB176	4th AF Amplifier (left)
2SB176	4th AF Amplifier (right)
2SB473	Power Output (left)
2SB473	Power Output (left)
2SB473	Power Output (right)
2SB473	Power Output (right)

Diodes:

SC-15	AFC
0A90	FM AGC

0A90	FM	AGC	
0A90	FM	AGC	
0A90	FM	Discriminator	} Pair
0A90	FM	Discriminator	
0A90	AM	Detector	
0A90	Doubler	} Pair	
0A90	Doubler		
0A90	L-R Detector	} Two Pairs	
0A90	L-R Detector		
0A90	L-R Detector		
0A90	L-R Detector		
EYV-320D1R2J2	AOC		
ERT-D2FGK750S			
Temperature Compensator (four)			
FM 3 μ V/50 mW for 30 db Quieting			
AM 100 μ V/m/50mW			
5W-5W MPO (IHF)			
Power Output:			
Power Source:			
AC 110V, 125V, 210V, 240V			
50 ~ 60 Hz			
Speakers:			
Recorded Changer:			
Cartridge:			
Stylus:			
Phonomotor:			
Cabinet Dimensions:			
430 (W) x 175 (H) x 409 (D) mm			
(16-5/16") (6-7/8") (16-1/16")			
Speaker System			
232 (W) x 345 (H) x 190 (D) mm			
(9-1/8") (13-9/16") (7-1/2")			
Tuner Cabinet 10 kg. (22 lb.)			
Speaker System 2 kg. (4 lb. 6 1/2 oz) each			

Thermistors:

Sensitivity:

Weight:

〈EXPORT DIVISION〉

MATSUSHITA ELECTRIC TRADING CO., LTD.
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MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
RADIO and STEREO DIVISION

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PARTS IDENTIFICATION

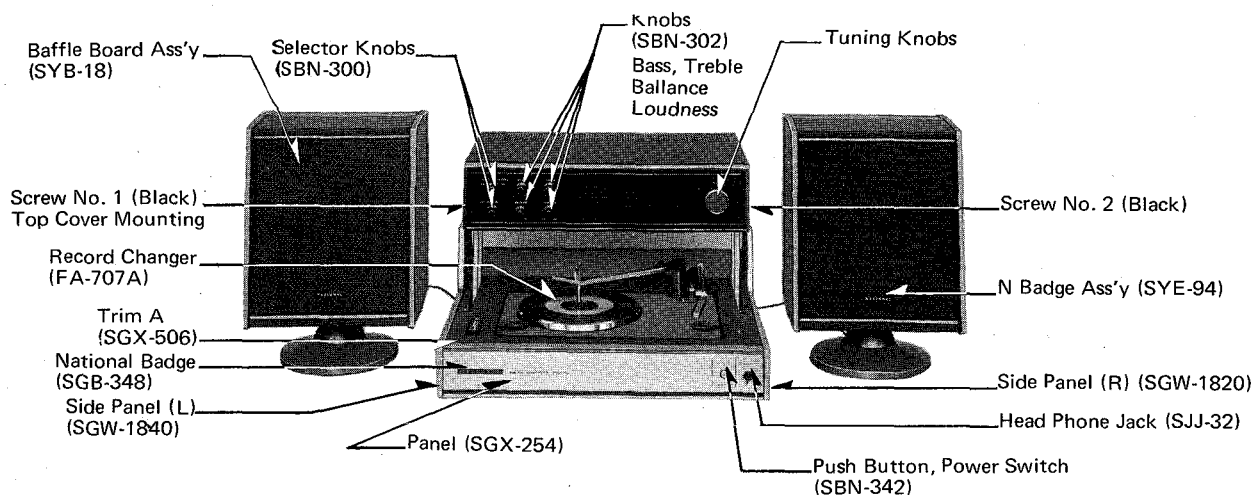


Fig. 1 FRONT VIEW

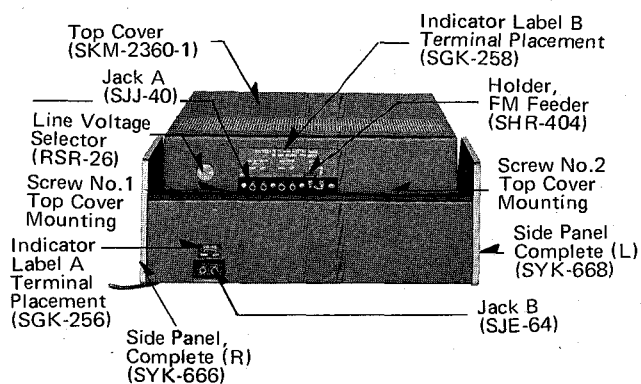


Fig. 2 REAR VIEW

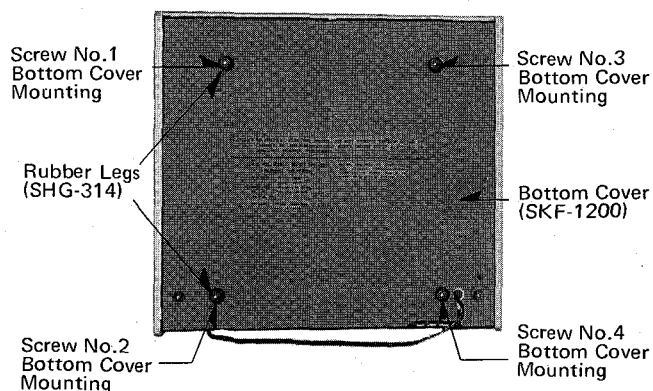


Fig. 3 BOTTOM VIEW

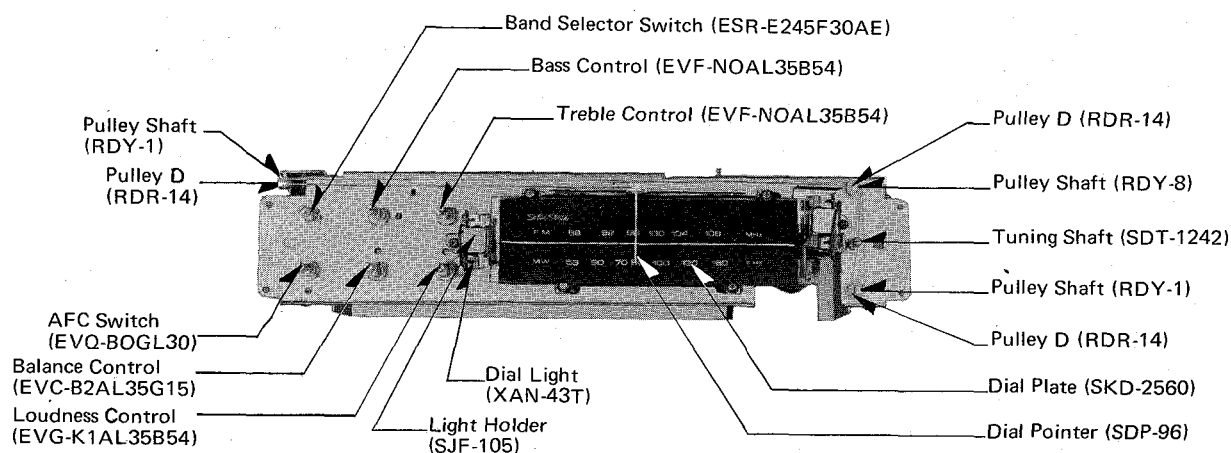


Fig. 4 CHASSIS

DISASSEMBLY INSTRUCTIONS

To Remove Speaker (Refer to Figs. 5 & 6)

1. Remove four (4) rear cover mounting screws, Nos. 1-4, as shown in Fig. 5.
2. Unsolder wires from speaker terminal.
3. Remove four (4) speaker mounting nuts, Nos. 7-10, as shown in Fig. 6.
4. To reassemble, reverse above procedure.

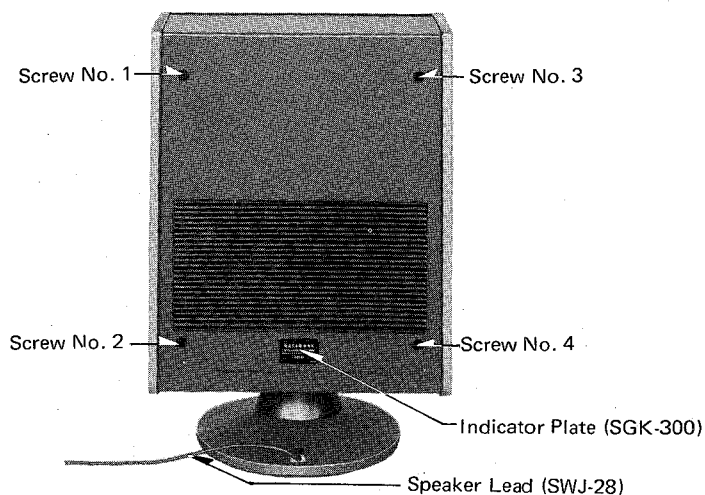


Fig. 5

To Remove Baffle Board (Refer to Figs. 5 & 6)

1. Remove four (4) rear cover mounting screws, Nos. 1-4, as shown in Fig. 5.
2. Remove four (4) speaker mounting nuts, Nos. 7-10, as shown in Fig. 6.
3. Remove six (6) baffle board mounting nuts, Nos. 1-6, as shown in Fig. 6.
4. To reassemble, reverse above procedure.

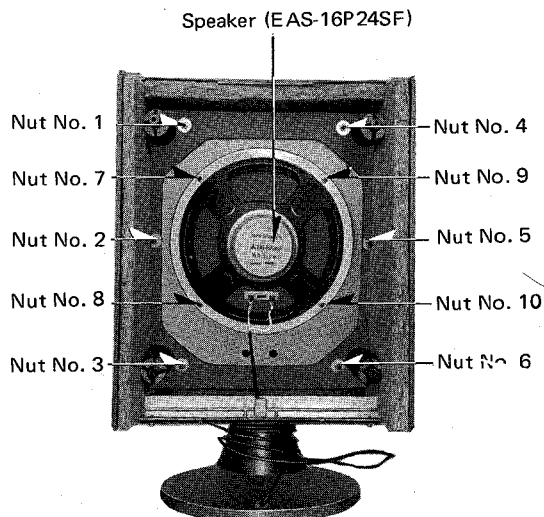


Fig. 6

To Remove Record Changer (Refer to Figs. 3 & 7)

1. Remove four (4) bottom cover mounting screws, Nos. 1-4, as shown in Fig. 3 on page 1.
2. Unplug receptacle housing from plug housing, as shown in Fig. 7.
3. Unplug two pin plugs from changer jacks, as shown in Fig. 7.
4. Remove four (4) changer mounting circlips and washers, as shown in Fig. 7.
5. To reassemble, reverse above procedure.

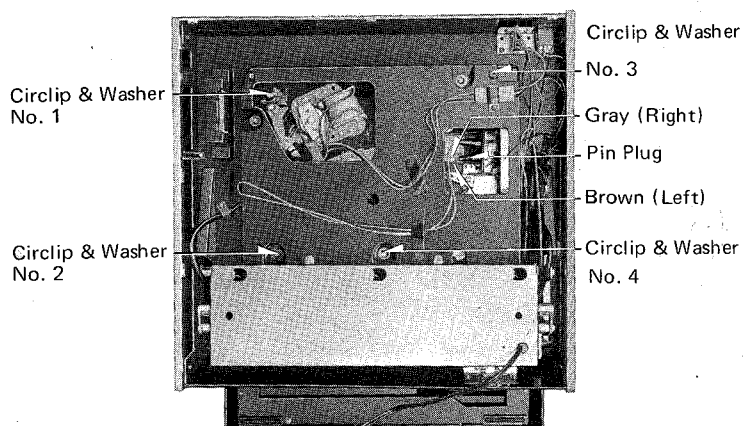


Fig. 7 BOTTOM VIEW (BOTTOM COVER OPEN)

DISASSEMBLY INSTRUCTIONS

To Remove Chassis

(Refer to Figs. 1, 2, 8 & 9)

1. Remove two (2) top cover mounting screws (left & right), Nos. 1-2, as shown in Fig. 1 on page 1.
2. Remove two (2) top cover mounting screws (rear side), Nos. 1-2, as shown in Fig. 2 on page 1.
3. Remove four (4) chassis mounting screws (left & right), Nos. 1-4, as shown in Figs. 8 & 9.
4. Unplug receptacle housing from plug housing and four pin plugs from pin jacks C, as shown in Figs. 8 & 9.
5. Remove lead holder from chassis as shown in Fig. 7.
6. To reassemble, reverse above procedure.

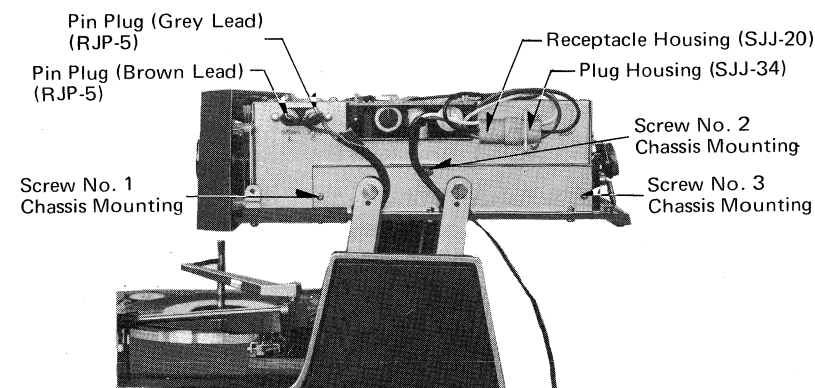


Fig. 8 RIGHT SIDE VIEW

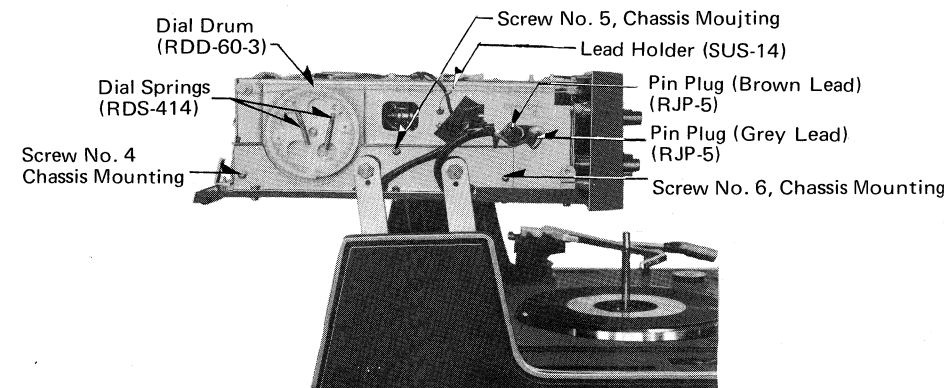


Fig. 9 LEFT SIDE VIEW

To Remove Escutcheon From Chassis (Refer to Figs. 9, 10 & 11)

1. Follow instruction 1 to 5 above.
2. Remove seven (7) chassis mounting screws Nos. 1-7, as shown in Figs. 10 & 11.
3. To reassemble, reverse above procedure.

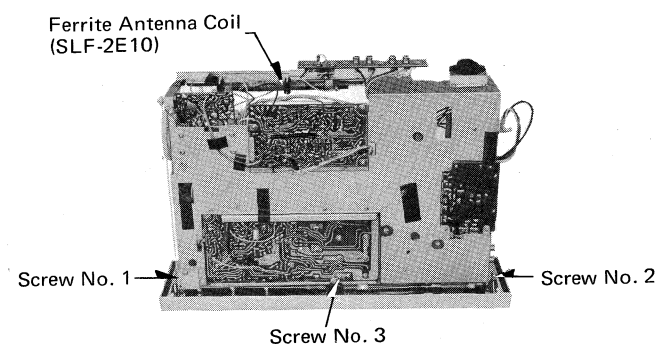


Fig. 10

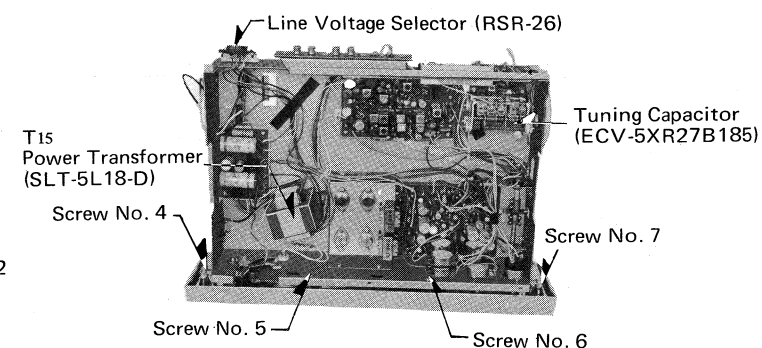


Fig. 11

DIAL CORD STRINGING GUIDE

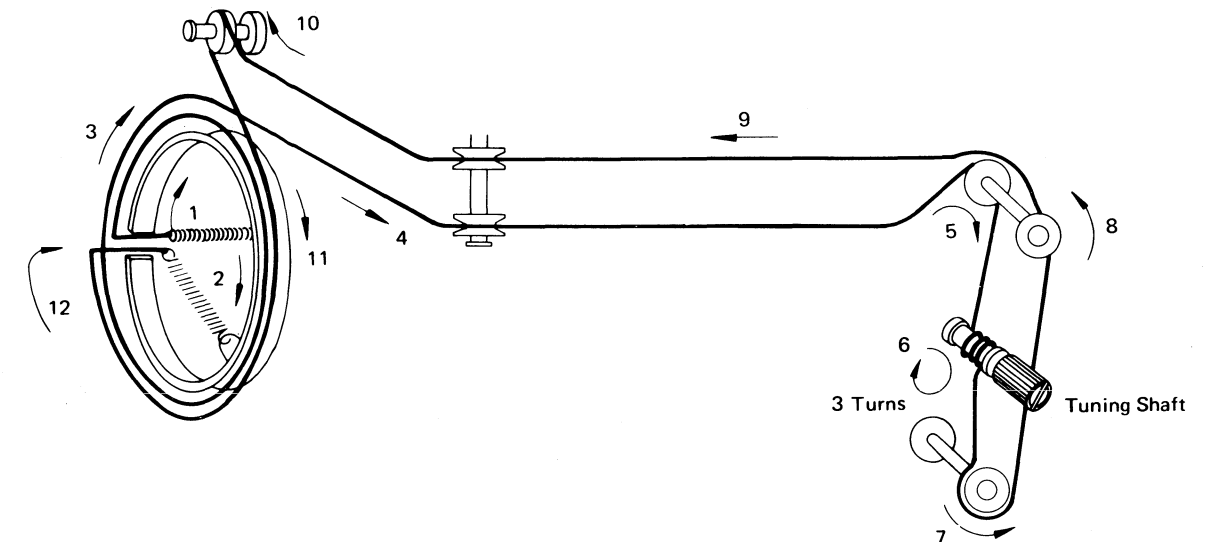


Fig. 12

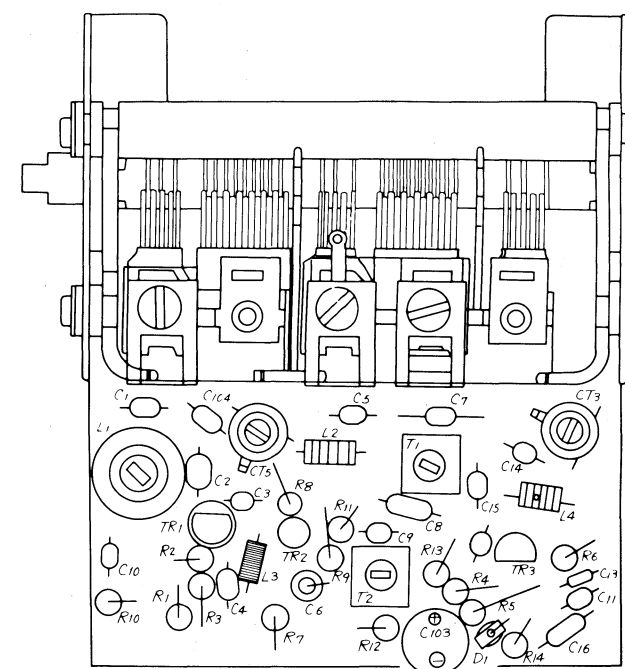
Notes:

1. Tuning capacitor should be positioned at minimum capacity (open).
2. Numbered arrows (1-12) indicate correct order of stringing dial cord.
3. Cement dial cord ends.

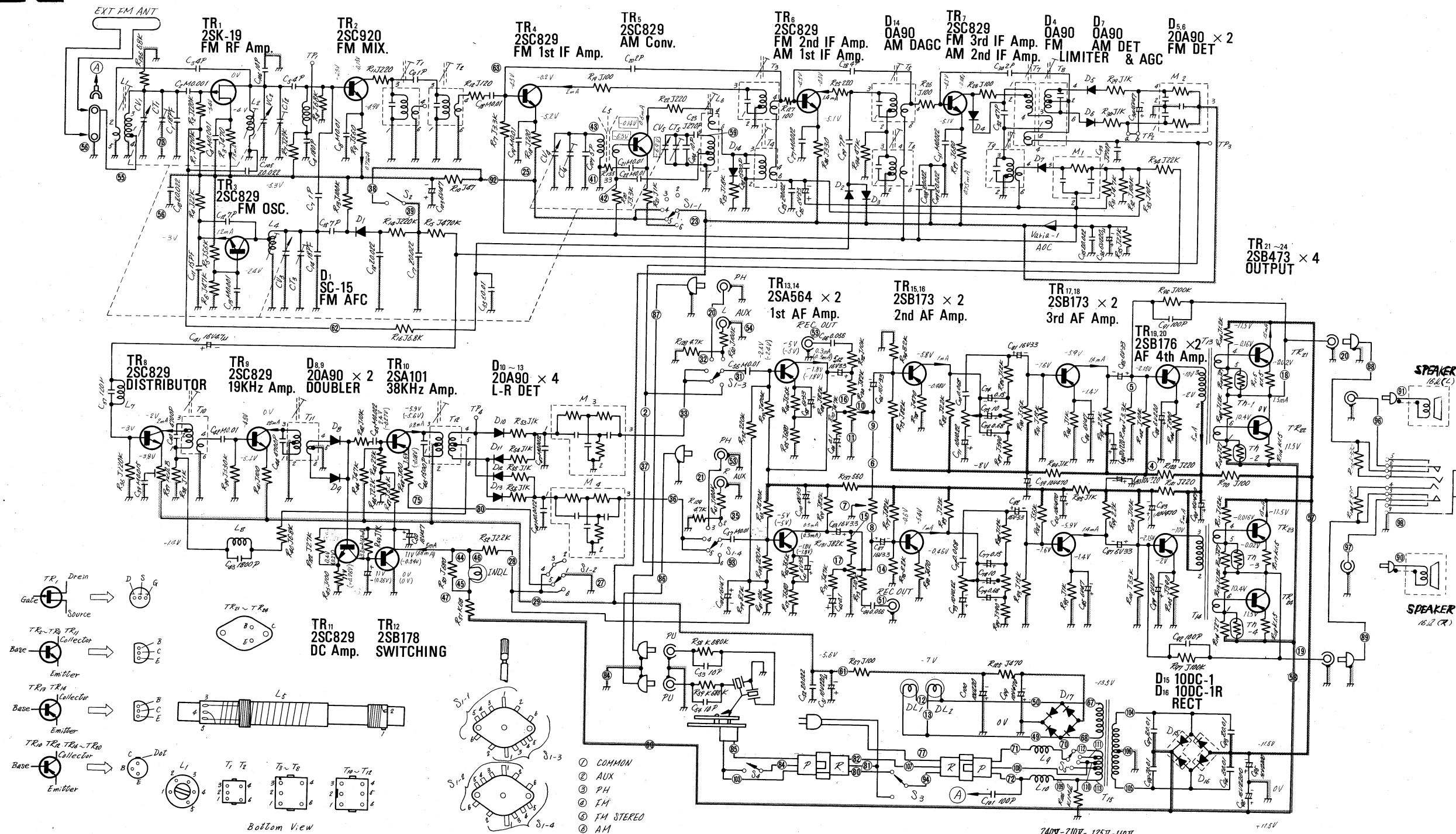
To Mount Dial Pointer

1. Set tuning capacitor to fully closed position.
2. Set dial pointer to starting point.
3. Attach dial cord to dial pointer.

PARTS IDENTIFICATION



-SCHEMATIC DIAGRAM MODEL SG-970A



R	2		7 8		9 11		14		10 12		54 53 18		135		23		62 63 64		25 72 34		74		27		28		123																																																																																																																																																																											
C	36	136	37	38	1	5	4	6	3	39	41	40	122	43	13	42	44	45	16	15	17	55	51	52	56	19	20	21	22	128	129	58	59	66	132	62	63	64	65	24	68	137	130	77	75	26	78	82	71	73	88	86	90	91	94	85	30	98	32	103	34	120	104	114	108	117	124																																																																																																																																			
L	37	39	1	3	4	41	12	13	7	14	15	8	49	16	45	17	50	103	46	55	18	19	48	107	21	20	22	104	53	57	27	110	58	69	65	66	70	72	75	78	81	35	36	33	34	80	83	97	93	95	96																																																																																																																																																			
T	7	1	8		2	4	3	5		6		9		10		11		12		13		14		15		16		17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		32		33		34		35		36		37		38		39		40		41		42		43		44		45		46		47		48		49		50		51		52		53		54		55		56		57		58		59		60		61		62		63		64		65		66		67		68		69		70		71		72		73		74		75		76		77		78		79		80		81		82		83		84		85		86		87		88		89		90		91		92		93		94		95		96												
S	10		11		1		2		12		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		32		33		34		35		36		37		38		39		40		41		42		43		44		45		46		47		48		49		50		51		52		53		54		55		56		57		58		59		60		61		62		63		64		65		66		67		68		69		70		71		72		73		74		75		76		77		78		79		80		81		82		83		84		85		86		87		88		89		90		91		92		93		94		95		96	

Notes:

1. S1-1 ~ S1-4 : Band Selector Switch in "FM STEREO" position.
2. S2 : FM AFC ON-OFF Switch in "ON" position.
3. S3 : Power Source Switch in "OFF" position.
4. S4 : Shut Off Switch in "OFF" position.
5. S5 : Power Source Voltage Selector in "110V" position.

5. DC voltages measured with vacuum tube voltmeter under no signal condition in "FM" position.

Measured DC voltages shown polarity with respect to chassis ground.

TR5		 AM position
TR1	~ 9	
TR15	~ 24	 FM position
TR10	~ 14	No Mark FM position
	()	 FM stereo position

	POSITIVE LINE
	GROUND LINE
	NEGATIVE LINE (AF CIRCUIT)
	NEGATIVE LINE (IF, RF & FM MPX CIRCUIT)

PARTS IDENTIFICATION

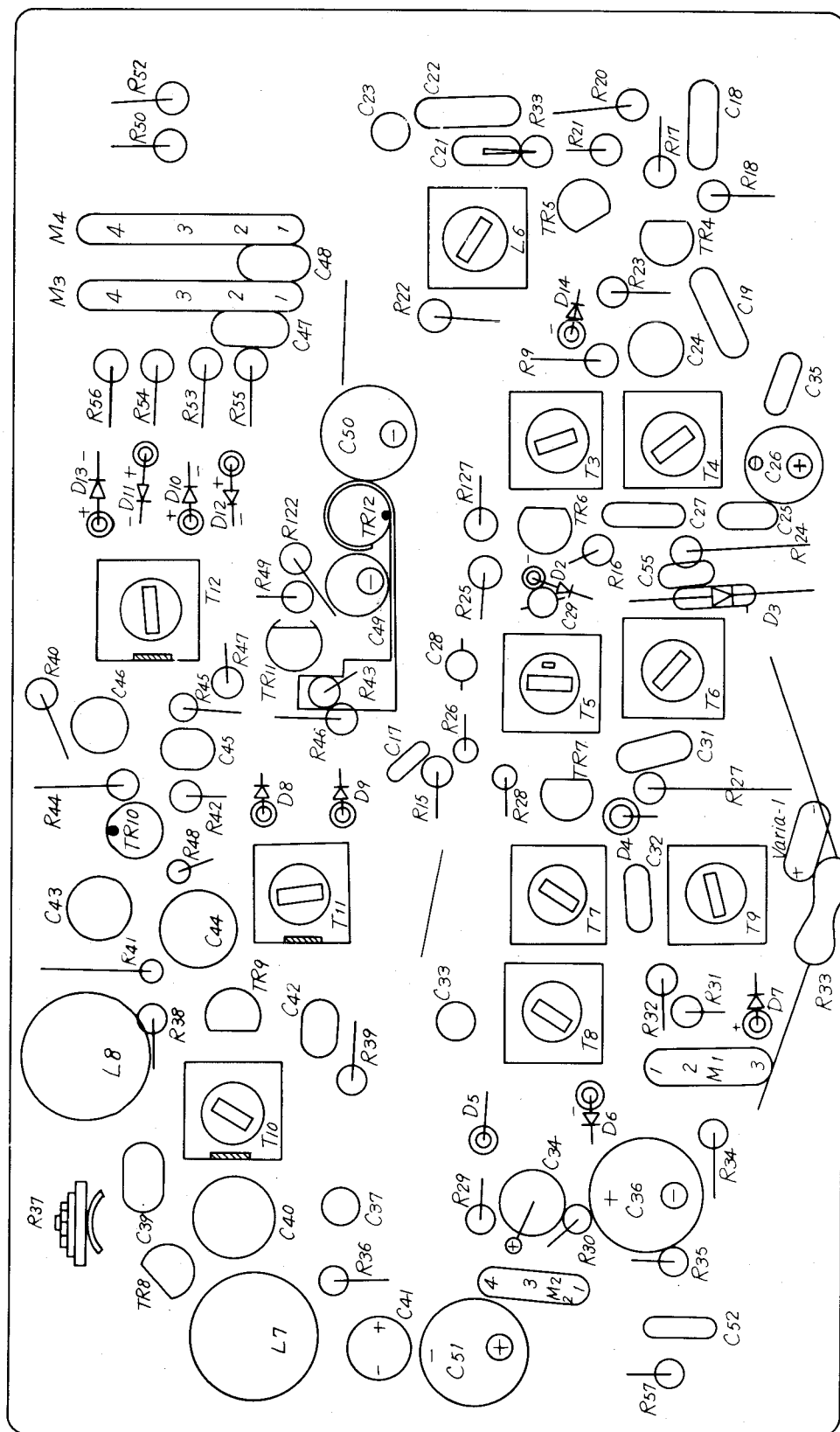


Fig. 15 IF (FM & AM) AND MULTIPLEX SECTION

PARTS IDENTIFICATION

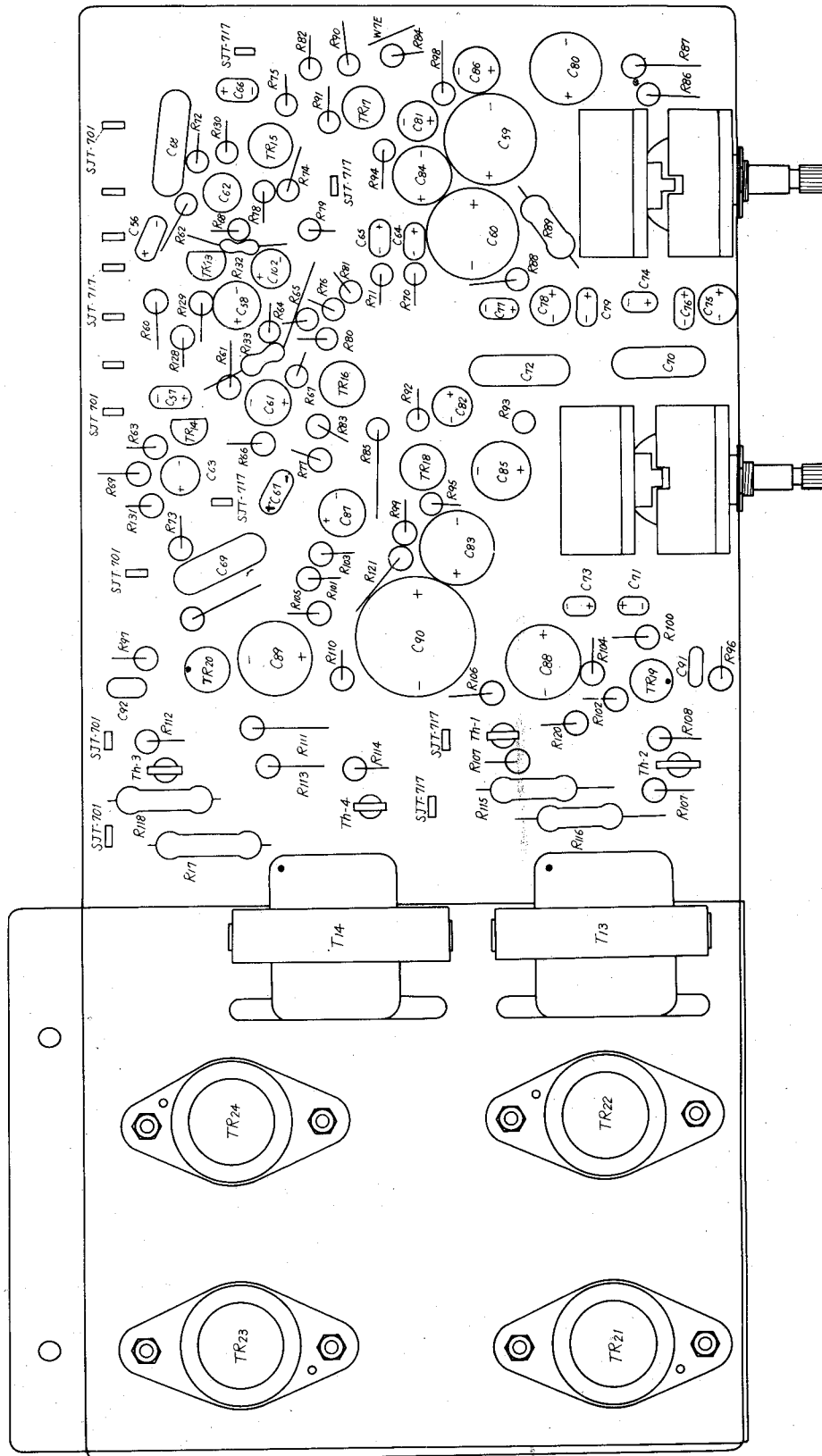
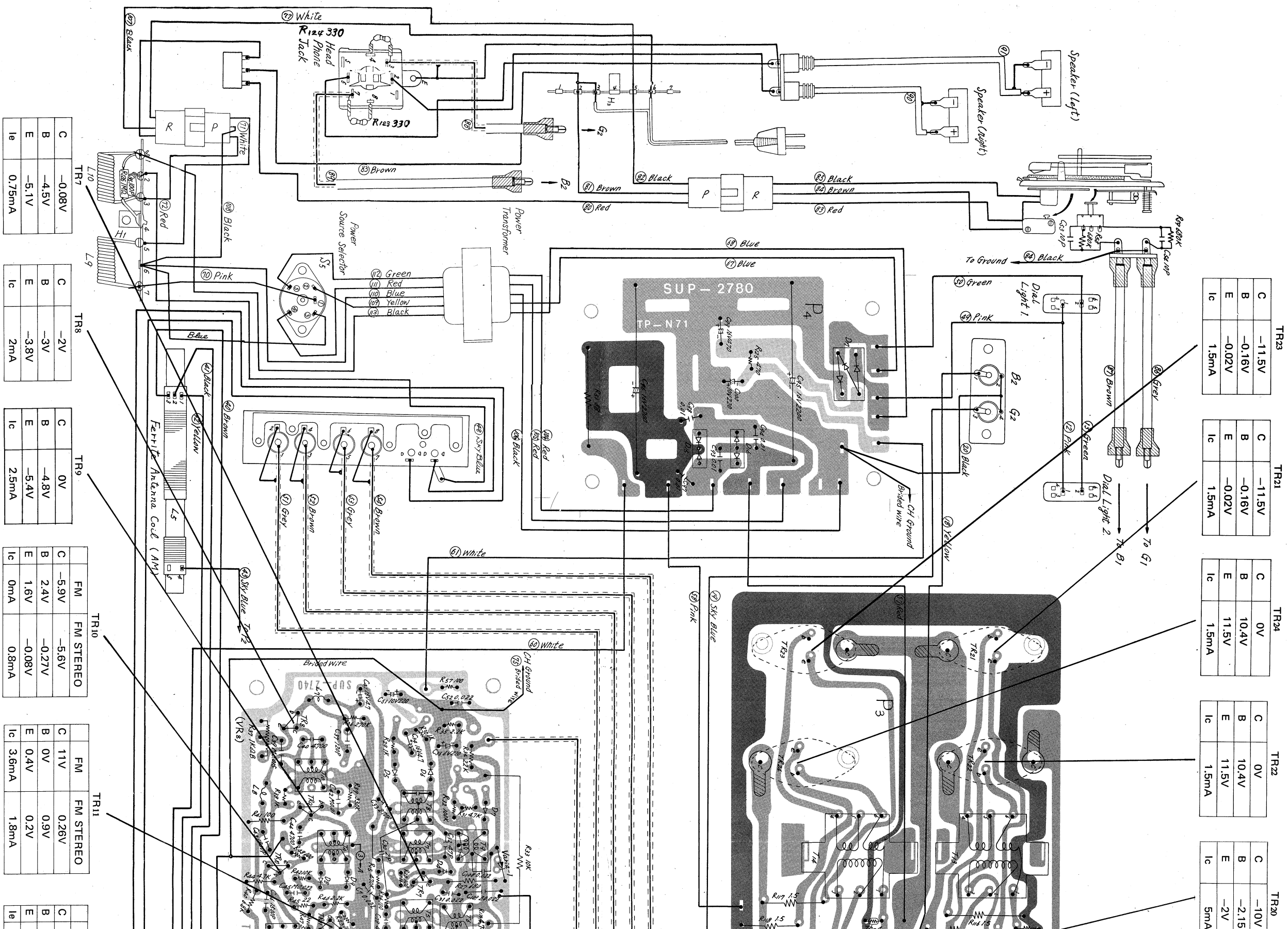
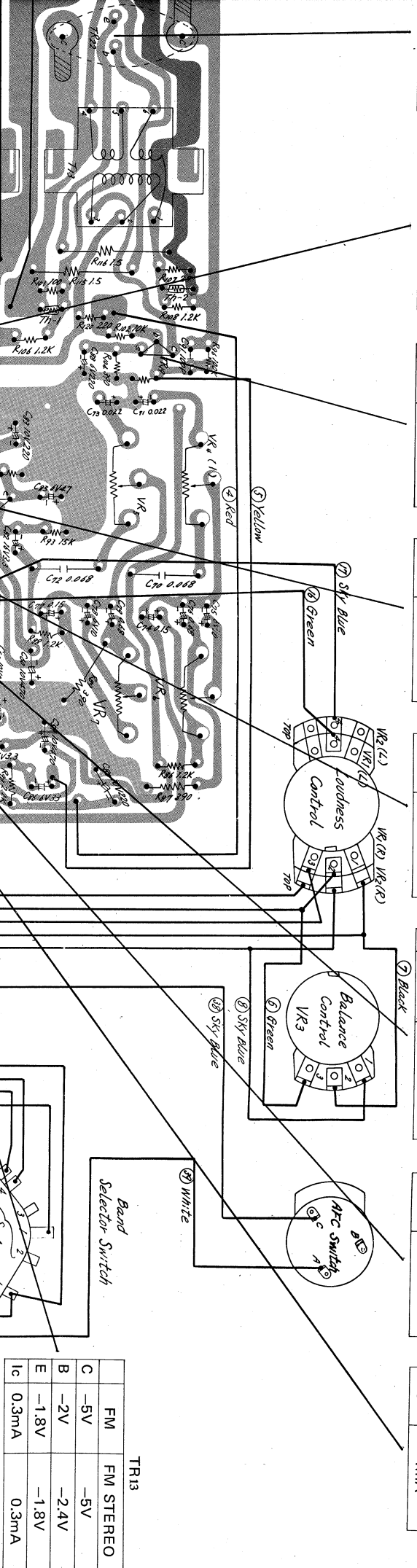


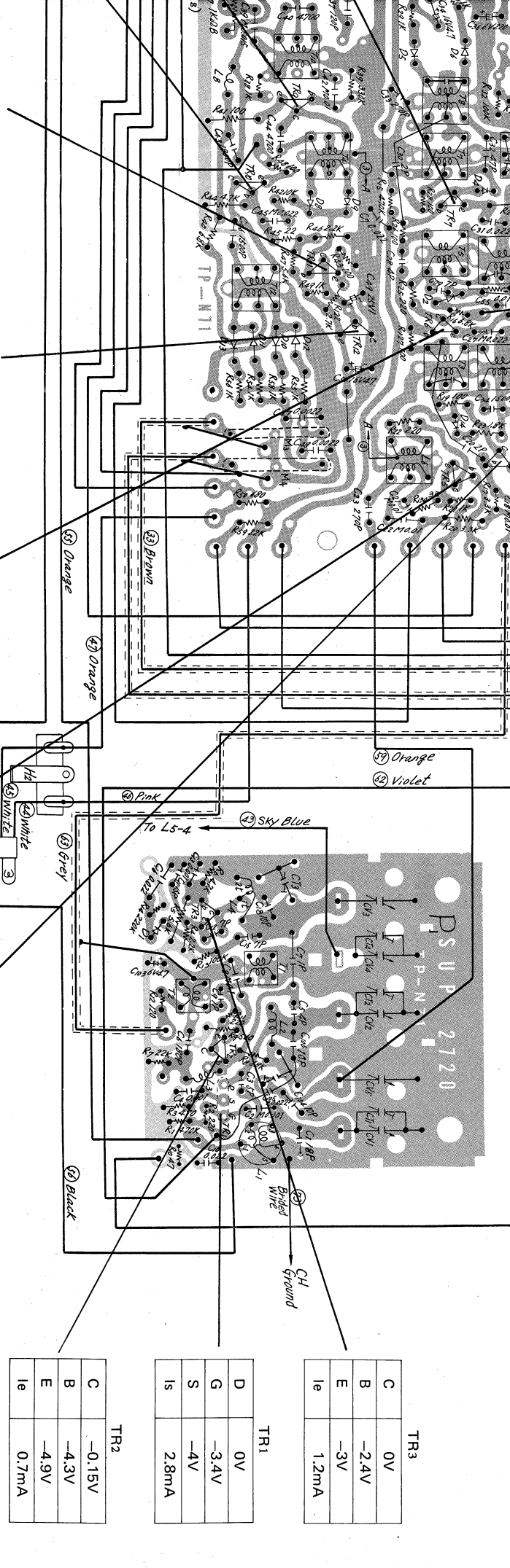
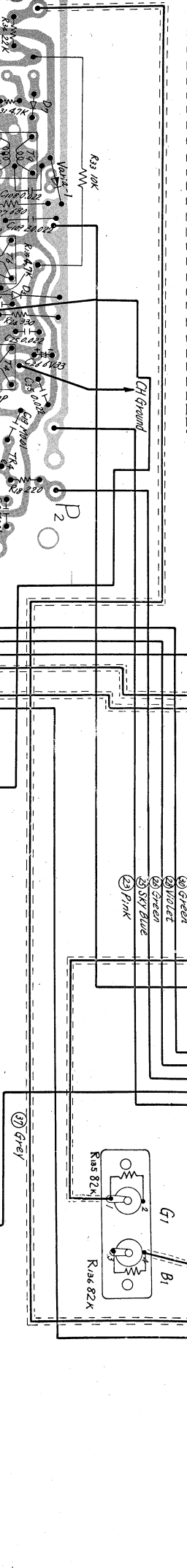
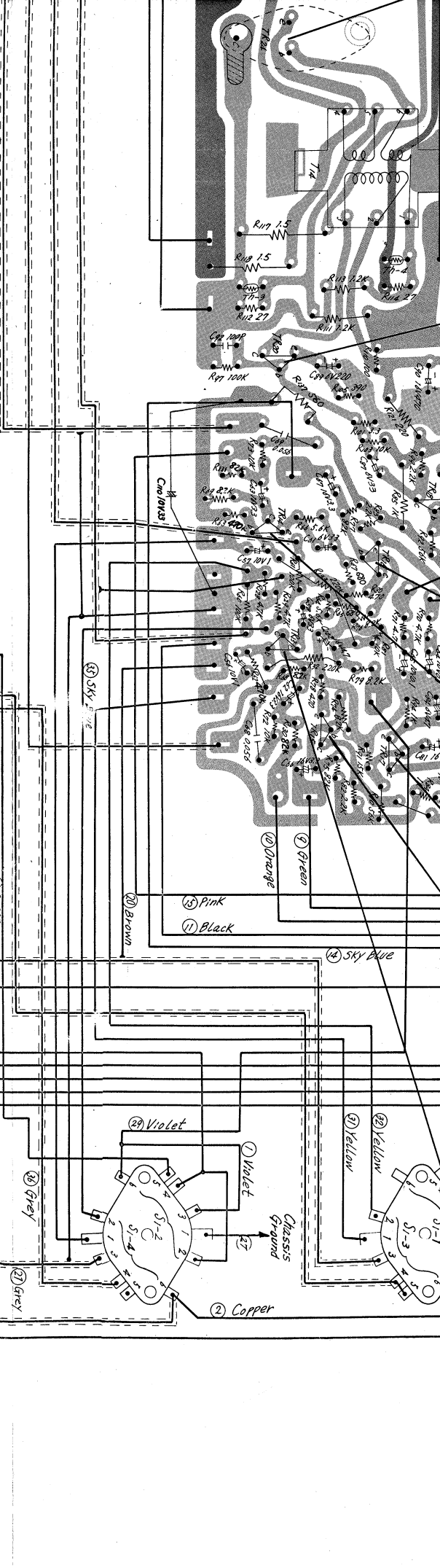
Fig. 16 AUDIO SECTION



TR22			TR20			TR19			TR18			TR16			TR14				TR17			TR15		
0V	C	-10V	C	-10V	C	-10V	C	-5.9V	C	-5.4V	C	-5V	FM	FM STEREO	C	-5.9V	C	-5.8V						
10.4V	B	-2.15V	B	-2.15V	B	-2.15V	B	-1.6V	B	-0.6V	B	-2V	B	-2.4V	B	-1.6V	B	-0.62V						
11.5V	E	-2V	E	-2V	E	-2V	E	-1.4V	E	-0.46V	E	-1.8V	E	-1.8V	E	-1.4V	E	-0.48V						
1.5mA	Ic	5mA	Ic	5mA	Ic	5mA	Ic	1.4mA	Ic	1mA	Ic	0.3mA	0.3mA	0.3mA	Ic	1.4mA	Ic	1mA						



TR13		
FM	FM STEREO	0V
5V	-5V	0V
2V	-2.4V	0V
1.8V	-1.8V	0V
0.3mA	0.3mA	0.3mA



TR11			TR12			TR6			TR5 Stereo Eye			TR4		
FM	FM STEREO	0V	FM	FM STEREO	0V	0V	C	-0.3V	0V	C	-0.14V	0V	C	-0.2V
11V	0.26V	0V	11V	0.26V	0V	11V	B	-4.5V	11V	B	-6.3V	11V	B	-4.5V
0V	0.9V	0V	0V	0.9V	0V	0V	E	-5.1V	0V	E	-6.9V	0V	E	-5.2V
0.4V	0.2V	0V	0.4V	0.2V	0V	0.4V	Ic	1.4mA	0.4V	Ic	0.6mA	0.4V	Ic	2mA
3.6mA	1.8mA	0V	3.6mA	1.8mA	0V	3.6mA	Ic	1.4mA	3.6mA	Ic	0.6mA	3.6mA	Ic	2mA

TR1			TR2			TR3		
0V	D	0V	0V	C	-0.15V	0V	C	0V
3.4V	G	-3.4V	3.4V	B	-4.3V	3.4V	B	-2.4V
4V	S	-4V	4V	E	-4.9V	4V	E	-3V
2.8mA	Ic	2.8mA	2.8mA	Ic	0.7mA	2.8mA	Ic	1.2mA

POSITIVE VOLTAGE LINE
 GROUND LINE
 NEGATIVE LINE (AF CIRCUIT)
 NEGATIVE LINE (IF, RF & FM MPX CIRCUIT)

ALIGNMENT INSTRUCTIONS

FREQUENCY & DISTANCE ON DIAL SCALE

To accurately align to the proper frequencies on the dial scale, refer to Table at right and mark the edge of the dial scale accordingly, using the "Start Point" mark on the dial scale as a reference point.

Table

Band	Frequency	Distance from "Start Point"
AM	550 kHz	9.2 mm
	1500 kHz	82.8 mm
FM	90 MHz	15.44 mm
	106 MHz	75.04 mm

Notes:

1. Loudness Control Maximum (AM-IF & RF, FM-RF), Minimum (FM-IF)
2. Bass Control Maximum
3. Treble Control Maximum
4. Band Selector AM, FM, FM STEREO
5. AFC Switch OFF (FM-IF & RF)
6. Output of signal generator should be no higher than necessary to obtain output reading.
7. Make certain that speaker system is connected to the tuner when aligning.

STEP	SIGNAL GENERATOR, or SWEEP GENERATOR		RADIO DIAL SETTING (DISTANCE)	INDICATOR (VTVM or SCOPE)	ADJUST	REMARKS
	CONNECTION	FREQUENCY				
AM-IF & RF ALIGNMENT						
1	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. with 400 Hz.	Point of noninterference (on/about 600 kHz)	Output meter across speaker jack (L). (Imp. 16Ω)	T4 (1st IFT) T6 (2nd IFT) T9 (3rd IFT)	Adjust for maximum output.
2	Fashion loop of several turns of wire and radiate signal into loop of receiver.	550 kHz 30% Mod. with 400 Hz.	550 kHz (9.2 mm)	Output meter across speaker jack (L). (Imp. 16Ω)	L5 (ANT Coil) L6 (OSC Coil)	Adjust for maximum output by sliding coil (L5) along ferrite core.
3	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1500 kHz 30% Mod. with 400 Hz.	1500 kHz (82.8 mm)	Output meter across speaker jack (L). (Imp. 16Ω)	CT4 (ANT Trimmer) CT5 (OSC Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).
* 1. Cement antenna bobbin with wax after completing alignment. 2. Make certain that speaker system is connected to tuner when aligning.						
FM-IF AND DETECTOR ALIGNMENT						
1	High side thru. .001mfd to point TP1. Common to chassis.	10.7 MHz (400 kHz SWP.)	Point of noninterference (on/about 98 MHz)	Connect vert. amp. of scope to point TP2. Common to chassis.	T1 (FM 1st IFT) T2 (FM 2nd IFT) T3 (FM 3rd IFT) T5 (FM 4th IFT) T7 (FM Disc. IFT)	Adjust for maximum amplitude and proper linearity between ±100 kHz markers. (Refer to Fig. 18)
2	High side thru. .001mfd to point TP1. Common to chassis.	10.7 MHz (400 kHz SWP.)	Point of noninterference (on/about 98 MHz)	Connect vert. amp. of scope to point TP3. Common to chassis.	T8 (FM Disc. IFT)	Adjust for maximum amplitude and proper linearity between ±100 kHz markers. (Refer to Fig. 19)
* 1. When aligning step 1, unsolder lead between TP2-a & TP2-b before alignment and resolder it after step 1 alignment. 2. Turn the core of T8 (FM Disc. IFT) fully counterclockwise before alignment.						
FM-RF ALIGNMENT						
1	Connect to EXT. FM antenna terminal through Dummy antenna. Common to chassis. (Refer to Fig. 20)	90 MHz 30% Mod. with 400 Hz.	90 MHz (15.44 mm)	Output meter across speaker jack (L). (Imp. 16Ω)	L4 (FM OSC Coil) L1 (FM ANT Coil) L2 (FM Collector Coil)	Adjust for maximum output.
2	Connect to EXT. FM antenna terminal through Dummy antenna. Common to chassis. (Refer to Fig. 20)	106 MHz 30% Mod. with 400 Hz	106 MHz (75.04 mm)	Output meter across speaker jack (L). (Imp. 16Ω)	CT3 (FM OSC Trimmer) CT1 (FM ANT Trimmer) CT2 (FM Collector Trimmer)	Adjust for maximum output. Repeat steps (1) and (2).
* As three output readings will be present, adjustments must be made at center frequency.						

ALIGNMENT INSTRUCTIONS

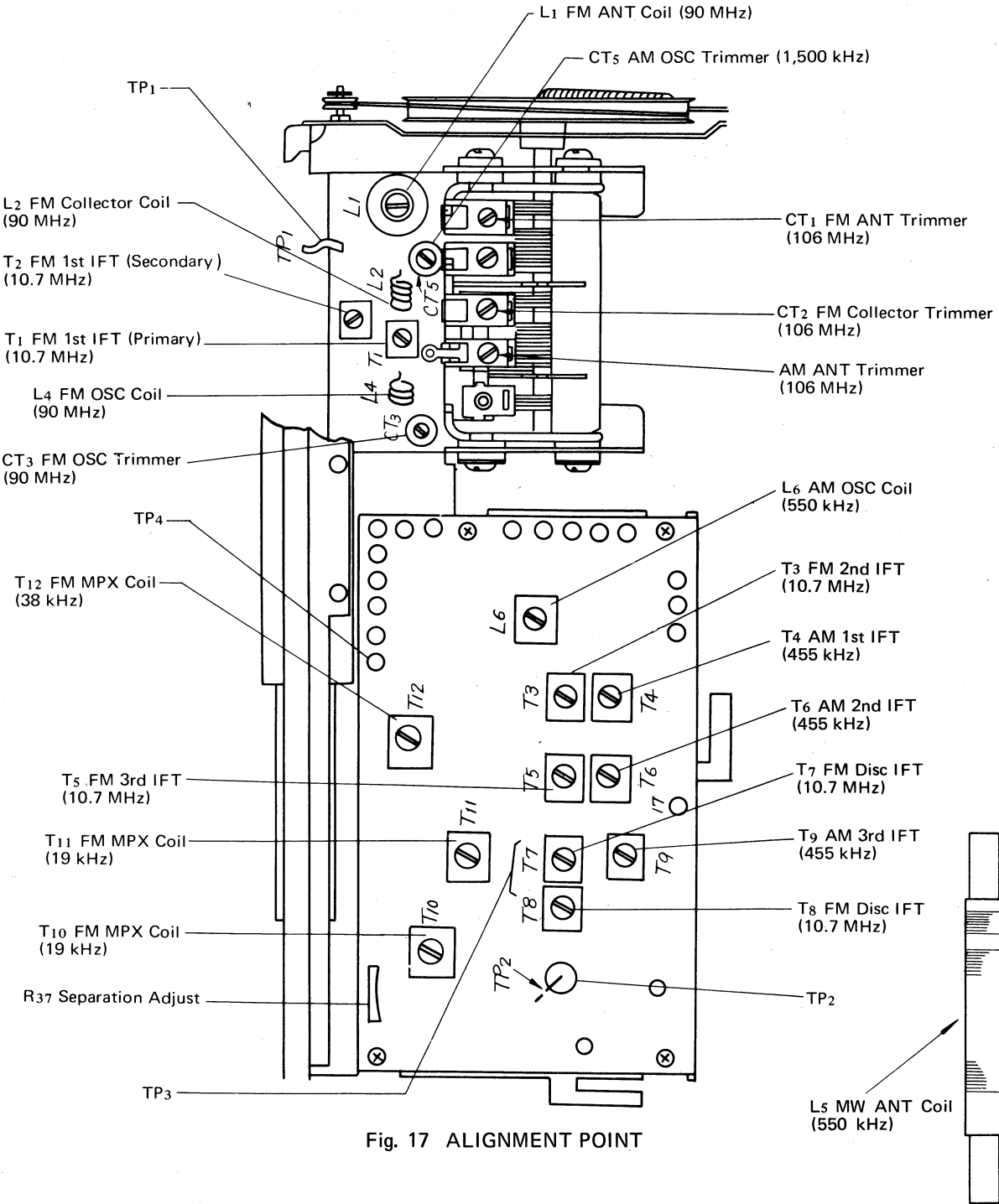


Fig. 17 ALIGNMENT POINT

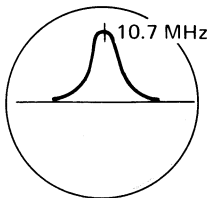


Fig. 18

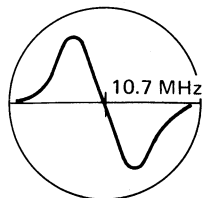


Fig. 19

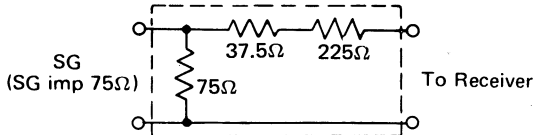
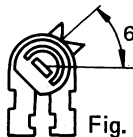


Fig. 20 FM DUMMY ANTENNA

ALIGNMENT INSTRUCTIONS

FM STEREO ALIGNMENT

Notes: 1. Stereo Modulator . . . Connect Stereo Modulator to EXT. Mod. terminal of signal generator. 2. Signal Generator . . . Modulation Rate of 19 kHz Pilot Signal . . . 10% Output Level 30 dB Frequency Approximately 89.5 MHz 3. Tuner Approximately 89.5 MHz			
 Fig. 21			
R37 SEPARATION CONTROL			
19 kHz AMP. ALIGNMENT			
EQUIPMENT CONNECTION			REMARKS
SIGNAL GENERATOR	OSCILLOSCOPE	ADJUST	
Connect to EXT FM antenna terminal through dummy antenna. (Refer to Fig. 19)	Connect vert. Amp. of scope to point TP4. Common to chassis.	T10 (19 kHz Coil) T11 (19 kHz Coil) T12 (38 kHz Coil)	Adjust T10 – T12 for maximum oscilloscope pattern of 38 kHz.
* When aligning, set separation control (R37) as shown in Fig. 21.			
SEPARATION ALIGNMENT			
Notes: 1. Signal Generator Modulation Rate of 19 kHz Pilot Signal 10% Modulation Rate of Right and Left Signal 27% Output Level 60 dB 2. Balance Control Adjust balance control so that output level from both units becomes equal.			
EQUIPMENT CONNECTION			REMARKS
SIGNAL GENERATOR	VTVM	OSCILLOSCOPE	
Connect to EXT FM antenna terminal through dummy antenna. (Refer to Fig. 19)	Connect across speaker jack. (left side) (Imp. 16Ω)	Connect to terminals of VTVM.	Adjust T12 & T10 for minimum indication on VTVM from the left side output when the right side of stereo modulator is modulated.
Connect to EXT FM antenna terminal through dummy antenna. (Refer to Fig. 19)	Connect across speaker jack. (left side) (Imp. 16Ω)	Connect to terminals of VTVM.	Adjust R37 for minimum indication on VTVM from the left side output when the right side of stereo modulator is modulated.
* Before separation aligning, disconnect lead between TP4 and Oscilloscope (A).			

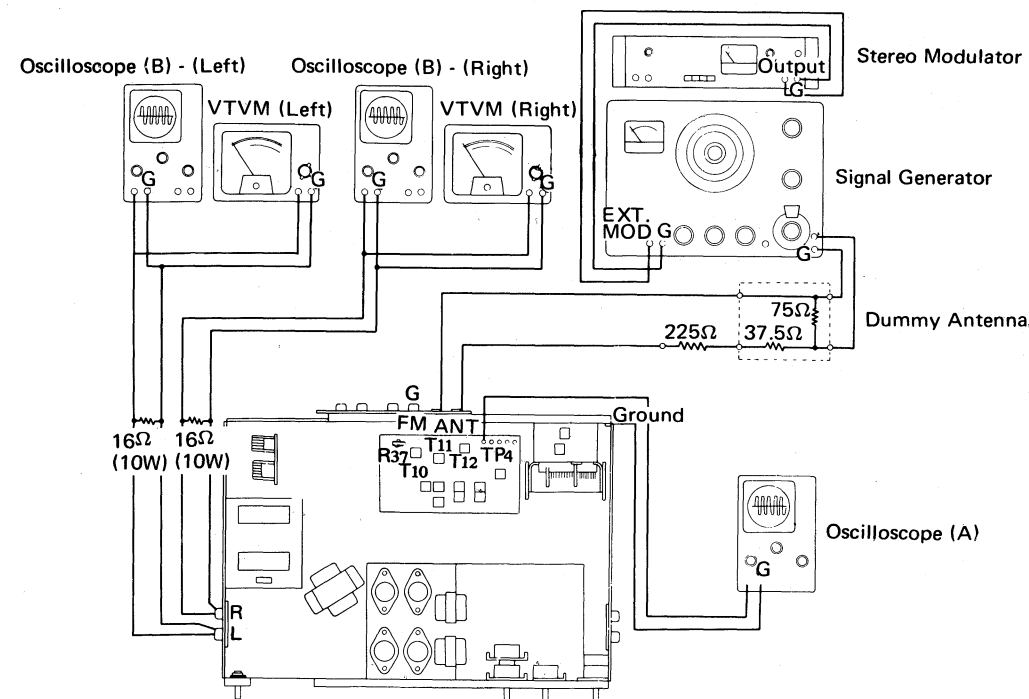


Fig. 22 RECOMMENDED EQUIPMENT CONNECTION FOR SEPARATION ALIGNMENT

SERVICING THE RECORD CHANGER

SPECIFICATIONS

Operating Voltage 120 Volts, AC
Turntable Speeds 16-2/3, 33-1/3, 45 and 78 RPM
Record Load Up to six 7", 10" or 12" records with any intermix at the same speed.

LUBRICATION

The Record Changer mechanism is well lubricated before leaving the factory; after prolonged use, it is advisable to relubricate certain parts.

A medium grease should be applied to the points as shown in Fig. 27.

ADJUSTMENT

Stylus Set-Down: During automatic operation the stylus sets down 1/8 inch from edge of record. Turning the stylus set down adjustment screw counter-clockwise causes the stylus to set down further in from the edge of the record. (See Fig. 24)

Pickup Arm Height: To raise, turn screw head by hand counter-clockwise; to lower, turn screw head clockwise. Adjust stylus to clear a full stack of records by 1/8 inch. (See Fig. 24)

Stylus Pressure: The needle pressure is adjusted at the factory for the correct pressure of 6 grams. Move the spring to different holes to set other pressure. (See Fig. 24)

DISASSEMBLY INSTRUCTIONS

1. Turntable Assembly

Remove Circlip and carefully lift Turntable Assembly off its bearing. When replacing Turntable Assembly, push the Idler Wheel Assembly towards the Turntable Center. This action will allow turntable to drop in position without damaging Idler Wheel.

2. Record Support Arm Assembly

Make sure the Unit has completed its cycle and the Pickup Arm returned to the Rest. Remove the Circlip and Washer from the bottom of the Record Support Arm Spindle. The Record Support Arm Assembly can then be removed from the top of the Unit.

3. Pickup Arm Assembly

The Unit should be disconnected from Power supply before attempting to remove the Pickup Arm Assembly. The Pickup Arm leads should be detached from the Terminal. Remove the Pickup Arm Spindle Nut pull the Pickup Arm Assembly upward.

4. Center Spindle Assembly

Move the Feed Link fully toward the Switch, then release. Remove the Center Spindle Assembly.

5. Idler Wheel

Remove the turntable (step 1). Remove Circlip carefully and lift off the Idler Wheel. Replace new Idler Wheel carefully on shaft.

DO NOT TOUCH OUTSIDE EDGE OF IDLER WHEEL OR LET IT CONTACT ANY OIL OR GREASE.

Note:

Refer to FA-707A Service Manual for more detailed service information.

REPLACING CARTRIDGE AND STYLUS

Stylus

1. Lift the Pickup Arm to a position that will make the stylus accessible.
2. Gently remove Stylus and place new Stylus in to correct position as shown Fig. 26.

Cartridge

1. Lift the Pickup Arm to a position that will make the Cartridge accessible.
2. The leads are removed gently by pulling the connectors off the Cartridge terminals.
3. Gently remove Cartridge by spreading the Cartridge Holder spring as shown in Fig. 25.

SERVICING THE RECORD CHANGER

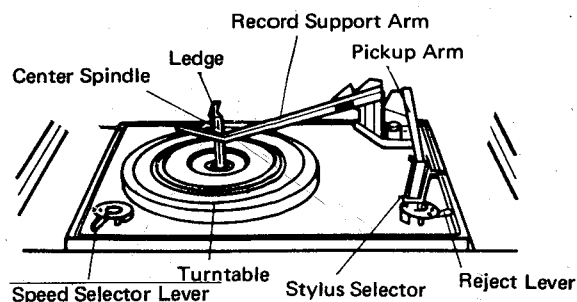


Fig. 23

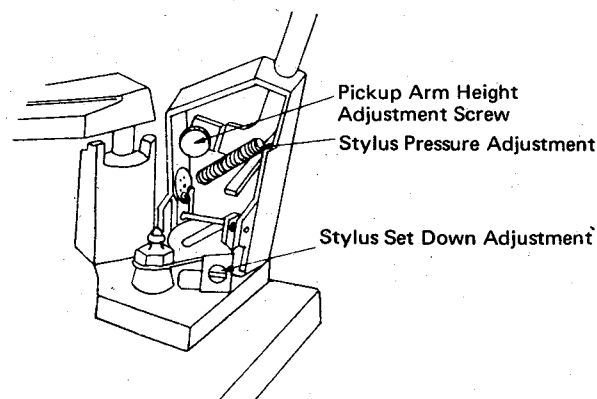


Fig. 24 PICKUP ARM ADJUSTMENT

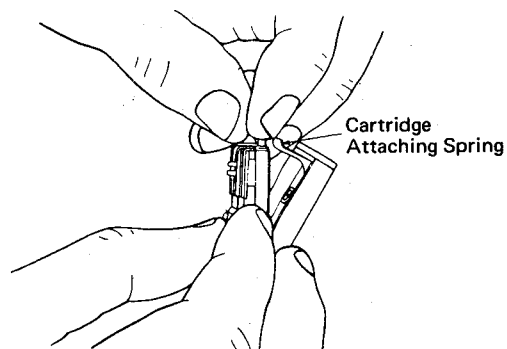


Fig. 25 REPLACING CARTRIDGE

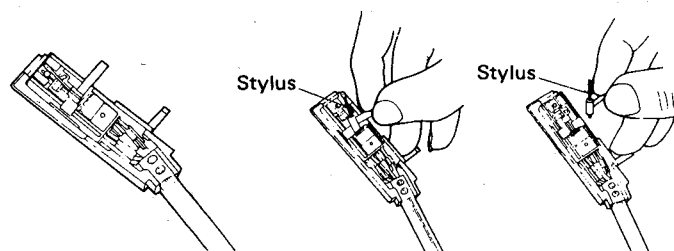


Fig. 26 REPLACING STYLUS

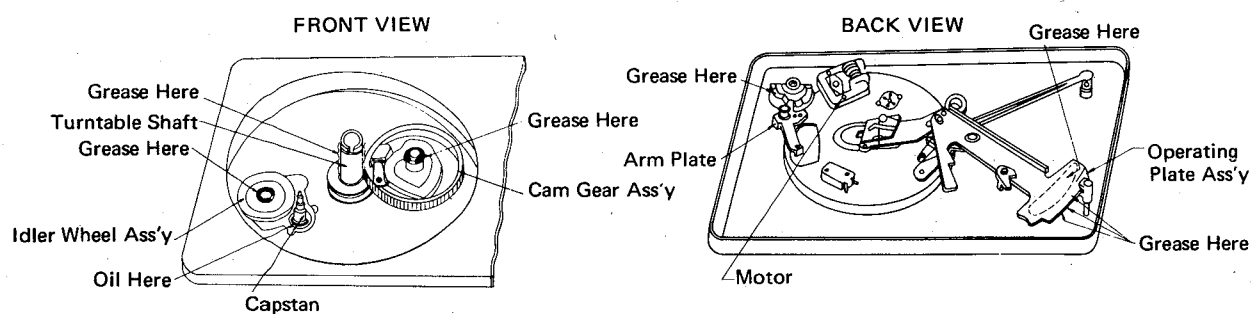


Fig. 27 LUBRICATION

RECORD CHANGER REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	PER SET (pcs.)	REMARKS
Automatic Record Changer				
1	FA-707A	Automatic Record Changer	1	
2	FU-PWR009	Circlip	1	
3	FU-TCA013	Turntable Rubber	1	
4	FU-TTA048	Turntable Assembly	1	
5	FU-ADA005	45 RPM Adapter Complete	1	
6	FU-JSA004	Center Spindle	1	
7	FU-KKP036	Speed Change Label	1	
8	FU-MPL082	Escutcheon Moulding	2	
9	FU-KLE009	Lever, Speed & Reject	2	
10	FU-KKP035	Reject Lavel	1	
11	FU-JIK076	Joggle Screw	3	
12	FU-GBS044	Cushion Rubber	3	
13	FU-PWM018	T. T Washer	2	
14	FU-PZB081	Idler off Lever	1	
15	FU-PTD043	Ball Race Assembly	1	
16	FU-PWF009	Felt	1	
17	FU-GAA010	Cam Gear Assembly	1	
18	FU-JBS138	Nut (Pickup)	1	
19	EPU-13TTCD	Pickup Arm Assembly	1	
20	FU-PWF055	Washer, Pickup	2	
21	FU-ETA113	Record Support Arm Assembly	1	
22	FU-NPA012	Actuating Slide Assembly	1	
23	FU-RSA033	Pickup Arm Rest Assembly	1	
24	FU-MPL079	Record Support Housing	1	
25	FU-PWM049	Washer, Record Support	1	
26	FU-BWR081	Spring, Record Support	1	
27	FU-JBS150	Boss, Record Support	1	
28	FU-ETA110	Main Plate Assembly	1	
29	FU-ETA104	Arm Plate Holder Assembly	1	
30	FU-MPL078	Cam, Speed Change	1	
31	FU-GBS039	Rubber Cushion	4	
32	FU-BCP059	Spring (Arm Plate)	1	
33	FU-JSC086	Screw A, Rubber	3	
34	FU-CPC7H-5	Capstan	1	
35	FU-PSP042	Motor Plate Holder	1	
36	FU-JPC091	Stud A	1	
37	FU-FPC092	Stud B	2	
38	2E-10GPL	Motor Assembly	1	
39	FU-IPA010	Idler Wheel Assembly	1	
40	FU-UPA037	Idler Holder Assembly	1	
41	FU-BTN095	Spring (Idler Holder)	1	

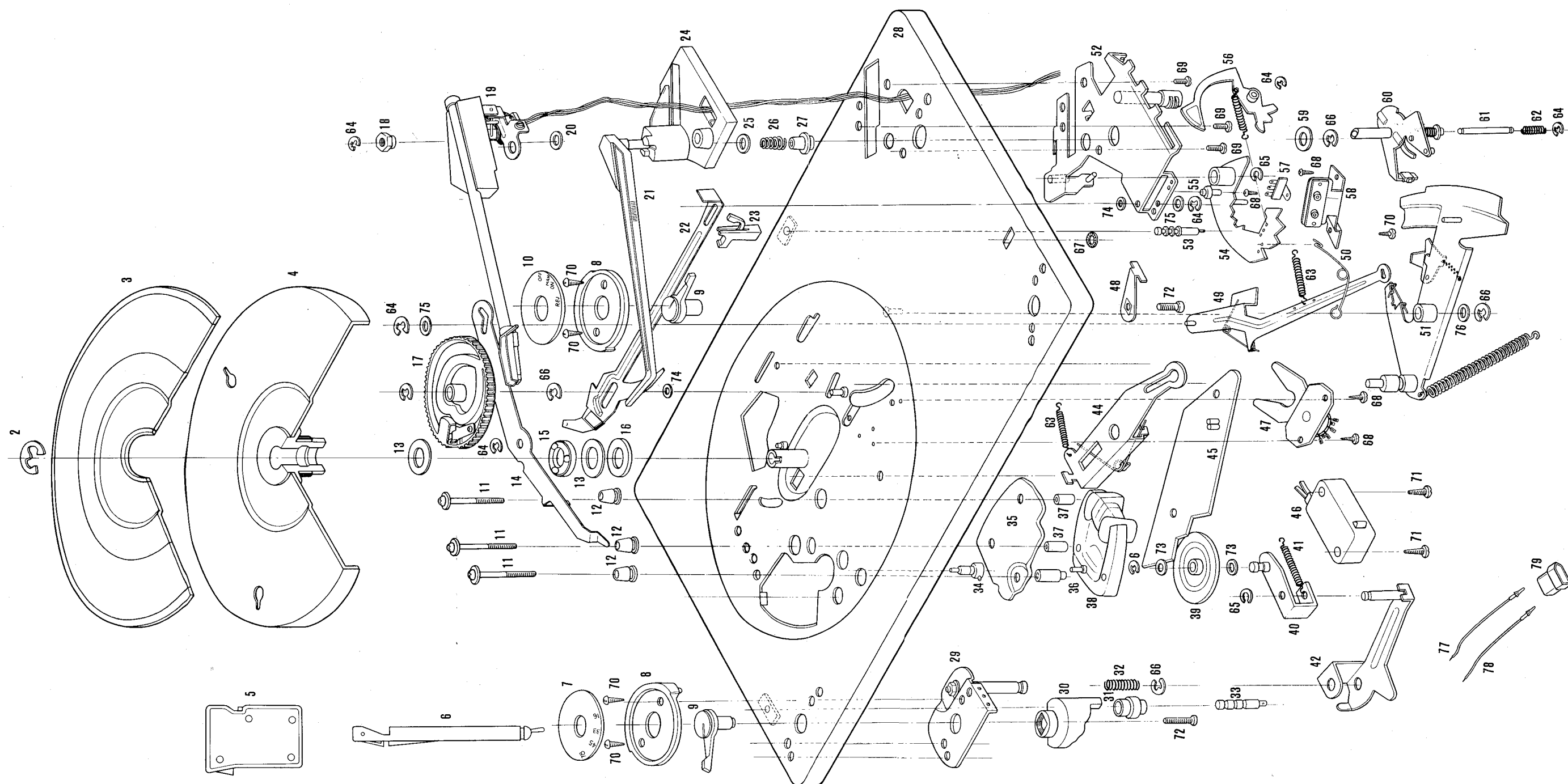
RECORD CHANGER REPLACEMENT PARTS LIST (Cont'd)

REF. NO.	PART NO.	DESCRIPTION	PER SET (pcs.)	REMARKS
42	FU-UPA036	Arm Plate Assembly	1	
43		Not used		
44	FU-ETA105	Feed Link Assembly	1	
45	FU-PFT239	Switch Base Assembly	1	
46	AM-77909	Micro Switch	1	
47	ESL-1812	Short Switch Assembly	1	
48	FU-PDR013	Operation Lever A	1	
49	FU-ETA102	Operation Lever B	1	
50	FU-BWR096	Spring	1	
51	FU-ETA143	Operating Plate Assembly	1	
52	FU-PKA010	Main Sub Plate Assembly	1	
53	FU-JSC087	Screw B, Rubber Cushion	1	
54	FU-ETA142	Index Plate Assembly	1	
55	FU-GPL012	Rubber Cushion	1	
56	FU-ETA106	Selector Assembly	1	
57	FLPV-3N	Terminal	1	
58	FU-ETA133	Socket Holder Assembly	1	
59	FU-PWM059	Washer	1	
60	FU-ETA108	Pickup Plate-A Assembly	1	
61	FU-JIK060	Pickup Arm Raising Spindle Ass'y	1	
62	FU-BCP055	Magnet (Actuating Slide) Spring, Pickup Plate A	1	
63	FU-BTN084	Spring (Feed Link)	1	
64	ER-30S	Circlip	7	
65	ER-40S	Circlip	2	
66	ER-50S	Circlip	4	
67	OHW-30W	Toothed Lock Washer	1	
68	JMP-3060UF ₂	Self Tapping Screw	4	
69	JMP-3080UF ₂	Self Tapping Screw	6	
70	JMP-30100UF ₂	Screw	5	
71	JMP-30160UF ₂	Self Tapping Screw	2	
72	JMP-40120UF ₂	Self Tapping Screw	2	
73	FU-PWF062	Washer	2	
74	FU-PWF059	Washer, Actuating Plate	1	
75	KPW-40SB2	Washer	2	
76	FU-PWF019	Washer	1	
77	L18U17R475	Lead Wire A Red	1	
78	L18U17C475	Lead Wire B Brown	1	
79	EPG-1396P1	Plug Housing	1	
	ERD-12TK684	680k Ω 1/6 Watt $\pm 10\%$ Solid	2	
	ECK-D05100MY	10pF 50WV $\pm 1pF$ Ceramic	2	
	EPC-34TTCD	Cartridge	1	
	ESP-13TTSD	Stylus (Diamond)	1	

REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	PER SET (pcs.)	REMARKS
TRANSISTORS				
TR1	2SK19	FM RF Amplifier	1	
TR2	2SC920	FM Mixer	1	
TR3	2SC829	FM Oscillator	1	
TR4	2SC829	FM 1st IF Amplifier	1	
TR5	2SC829	AM Converter	1	
TR6	2SC829	FM 2nd IF Amp. & AM 1st IF Amp.	1	
TR7	2SC829	FM 3rd IF Amp. & AM 2nd IF Amp.	1	
TR8	2SC829	Distributor	1	
TR9	2SC829	19kHz Amplifier	1	
TR10	2SA101	38kHz Amplifier	1	
TR11	2SC829	DC Amplifier	1	
TR12	2SB178	DC Switching	1	
TR13, 14	2SA564	1st AF Amplifier (L & R)	2	
TR15, 16	2SA173	2nd AF Amplifier (L & R)	2	
TR17, 18	2SA173	3rd AF Amplifier (L & R)	2	
TR19, 20	2SB176	4th AF Amplifier (L & R)	2	
TR21, 22, 23, 24	2SB473	Power Output (L & R)	4	
DIODES				
D1	SC-15	AFC	1	
D2, 3, 4	0A90	FM AGC	3	
D5, 6	0A90	FM Discriminator (pair)	2	
D7	0A90	AM Detector	1	
D8, 9	0A90	Doubler (pair)	2	
D10, 11, 12, 13	0A90	L-R Detector (pair) . . . D10, 11 & D12, 13	4	
D14	0A90	AM D. AGC	1	
D15	10DC-1	Rectifier	1	
D16	10DC-1R	Rectifier	1	
D17	12B-2B1P-M	Rectifier	1	
Va-1	EYV-320D1R2J2	AOC (Ceramic Diode Varister)	1	
THERMISTORS				
TH1~4	ERT-D2FGK750S	Temperature Compensator	4	
COILS AND TRANSFORMERS				
L1	SLA-4P6	FM Antenna Coil	1	New
L2	SLD-4Y4	FM Collector Coil	1	New
L3	SLQ-Y11G-2	IF Trap Coil	1	

EXPLODED VIEW OF RECORD CHANGER



REPLACEMENT PARTS LIST (Cont'd)

REF. NO.	PART NO.	DESCRIPTION	PER SET (pcs.)	REMARKS				
				RF	IF	AF	P.S	CH
L4	SLO-4Y2	FM Oscillator Coil	1					
L5	SLF-2E10	AM Ferrite Antenna Coil	1					
L6	SLO-2C12M	AM Oscillator Coil	1					
L7, 8	SLO-V394-2Y	Multiplex Filter	2					
L9, 10	SLO-Y35G-2D	RFC	2					
T1, 2	SLI-4B102	FM 1st & 2nd IFT	2					
T3	SLI-4C32M	FM 3rd IFT	1					
T4	SLI-2C14M	AM 1st IFT	1					
T5	SLI-4C22M	FM 4th IFT	1					
T6	SLI-2C22M	AM 2nd IFT	1					
T7	SLI-4C56M	FM Disc. IFT	1					
T8	SLI-4C58M	FM Disc. IFT	1					
T9	SLI-2C42M	AM 3rd IFT	1					
T10	SLM-2C4K	Multiplex 19kHz Coil	1					
T11	SLM-2C2K	Multiplex 19kHz Coil	1					
T12	SLM-3C2K	Multiplex 38kHz Coil	1					
T13, 14	SLT-3H4	Input Transformer	2					
T15	SLT-5L18-D	Power Transformer	1					New
COMPONENT COMBINATION								
M1	EXA-F203Z471	0.02μFZ, 470Ω (two)	1					
M2	EXA-5DL04C	4.7kΩ (two), 330pF (three)	1					
M3, 4	EXA-6FC02	22kΩ (two), 10kΩ, 200pF (two), 410pF	2					
RESISTORS				RF	IF	AF	P.S	CH
R107, 109, 112, 114	ERD-14VJ270	27Ω 1/4Watt ±5% Carbon	4			4		
R10	ERD-14VJ470	47Ω 1/4Watt ±5% Carbon	1	1				
R19, 26, 28, 41, 43, 48, 57, 127, 110	ERD-14VJ101	100Ω 1/4Watt ±5% Carbon	9		8	1		
R12	ERD-14VJ121	120Ω 1/4Watt ±5% Carbon	1	1				
R11, 18, 22, 25, 120, 121	ERD-14VJ221	220Ω 1/4Watt ±5% Carbon	6	1	3	2		
R24	ERD-14VJ331	330Ω 1/4Watt ±5% Carbon	1		1			
R87, 104, 105	ERD-14VJ391	390Ω 1/4Watt ±5% Carbon	3			3		
R3, 78, 80, 125	ERD-14VJ471	470Ω 1/4Watt ±5% Carbon	4	1		2	1	
R9, 137	ERD-14VJ561	560Ω 1/4Watt ±5% Carbon	2	1	1			
R27, 65, 67	ERD-14VJ681	680Ω 1/4Watt ±5% Carbon	3		1	2		
R21, 29, 30, 38, 49, 53, 54, 55, 56, 84, 85, 94, 95	ERD-14VJ102	1kΩ 1/4Watt ±5% Carbon	13		9	4		

REPLACEMENT PARTS LIST (Cont'd)

REF. NO.	PART NO.	DESCRIPTION	PER SET (pcs.)	REMARKS				
				RF	IF	AF	P.S	CH
R86, 88, 106, 108, 111, 113	ERD-14VJ122	1.2kΩ 1/4Watt ±5% Carbon	6			6		
R23	ERD-14VJ182	1.8kΩ 1/4Watt ±5% Carbon	1		1			
R4, 35, 45, 46, 52, 82, 83, 98, 99	ERD-14VJ222	2.2kΩ 1/4Watt ±5% Carbon	9	1	4	4		
R122	ERD-14VJ272	2.7kΩ 1/4Watt ±5% Carbon	1		1			
R17, 20, 100, 101	ERD-14VJ332	3.3kΩ 1/4Watt ±5% Carbon	4		2	2		
R6, 31, 70, 71, 128, 129, 134	ERD-14VJ472	4.7kΩ 1/4Watt ±5% Carbon	7	1	2	4		
R5, 47, 64, 66	ERD-14VJ562	5.6kΩ 1/4Watt ±5% Carbon	4	1	1	2		
R16, 40, 136	ERD-14VJ682	6.8kΩ 1/4Watt ±5% Carbon	3	1	2			
R68, 69, 74, 76, 79	ERD-14VJ822	8.2kΩ 1/4Watt ±5% Carbon	5			5		
R42, 72, 73, 81, 102, 103	ERD-14VJ103	10kΩ 1/4Watt ±5% Carbon	6		1	5		
R91, 93	ERD-14VJ153	15kΩ 1/4Watt ±5% Carbon	2			2		
R7, 34	ERD-14VJ223	22kΩ 1/4Watt ±5% Carbon	2	1	1			
R44	ERD-14VJ473	47kΩ 1/4Watt ±5% Carbon	1		1			
R90, 92	ERD-14VJ563	56kΩ 1/4Watt ±5% Carbon	2			2		
R8	ERD-14VJ683	68kΩ 1/4Watt ±5% Carbon	1	1				
R75, 77, 130, 131	ERD-14VJ823	82kΩ 1/4Watt ±5% Carbon	4			4		
R13, 32, 60, 61, 96, 97	ERD-14VJ104	100kΩ 1/4Watt ±5% Carbon	6	1	1	4		
R2, 14, 36, 132, 133	ERD-14VJ224	220kΩ 1/4Watt ±5% Carbon	6	2	2	2		
R39	ERD-14VJ334	330kΩ 1/4Watt ±5% Carbon	1		1			
R1, 15, 62, 63	ERD-14VJ474	470kΩ 1/4Watt ±5% Carbon	4	1	1	2		
R135	ERD-14TJ330	33Ω 1/4Watt ±5% Carbon	1		1			
R123, 124	ERD-14TJ331	330Ω 1/4Watt ±5% Carbon	2					2
R89	ERD-14TJ391	390Ω 1/4Watt ±5% Carbon	1			1		
R33	ERD-14TJ103	10kΩ 1/4Watt ±5% Carbon	1		1			
R51	ERD-1PZK680	68Ω 1Watt ±10% Carbon	1				1	
R50	ERC-12GK681	680Ω 1/2Watt ±10% Solid	1		1			
R126	ERC-12GM105	1MΩ 1/2Watt ±20% Solid	1					1
R115, 116, 117, 118	ERM-12P1R5	1.5Ω 1/2Watt ±10% Wire	4			4		
CAPACITORS								
C7, 9	ECC-D05010C	1pF 50WV ±0.25pF Ceramic	2	2				
C20, 30	ECC-D05020C	2pF 50WV ±0.25pF Ceramic	2		2			
C3, 5, 28	ECC-D05040C	4pF 50WV ±0.25pF Ceramic	3	2	1			
C107	ECC-D05050C	5pF 50WV ±0.25pF Ceramic	1	1				
C12, 15, 29	ECC-D05070C	7pF 50WV ±0.25pF Ceramic	3	2	1			

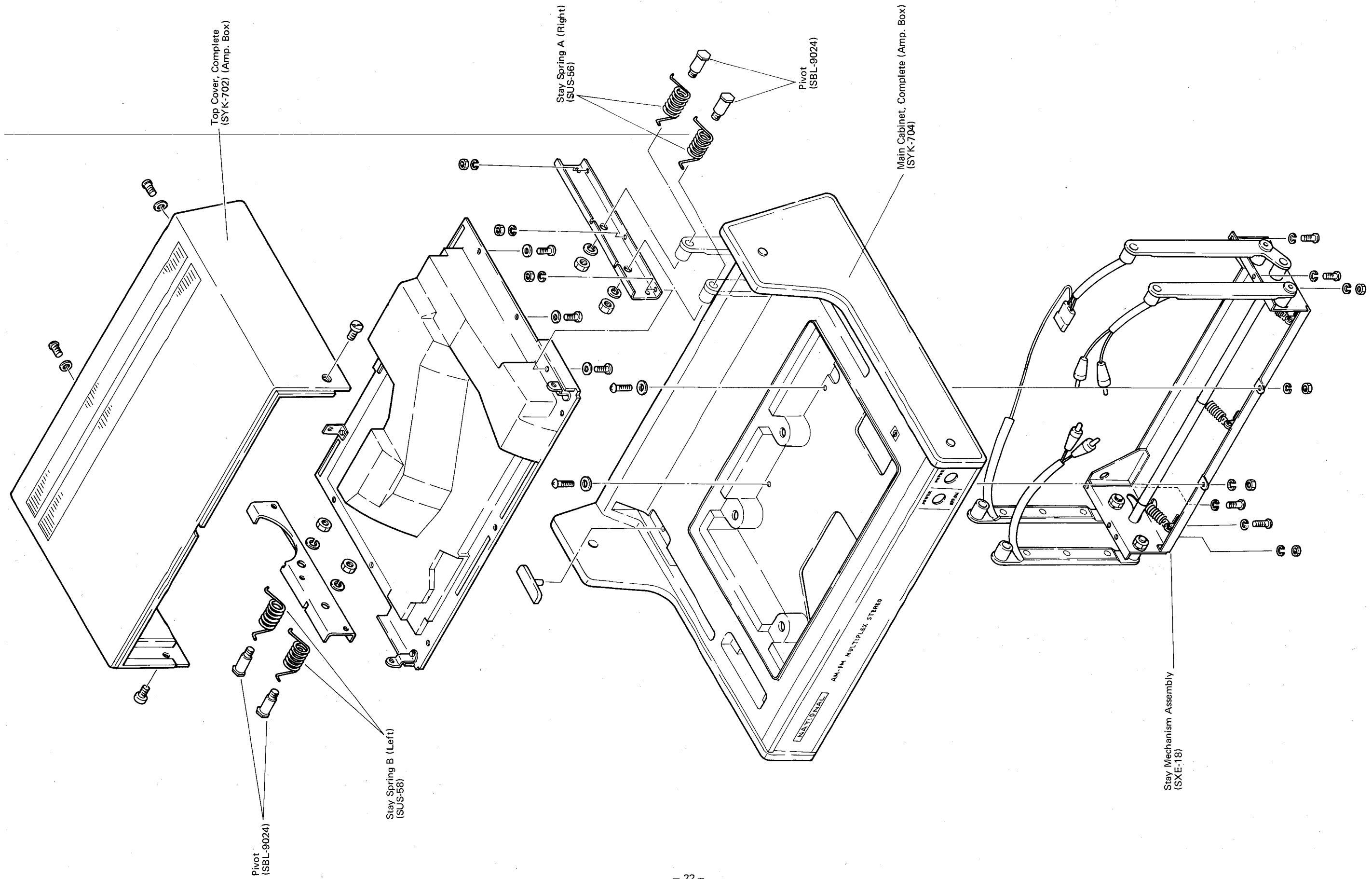
REPLACEMENT PARTS LIST (Cont'd)

REF. NO.	PART NO.	DESCRIPTION	PER SET (pcs.)	REMARKS				
				RF	IF	AF	P.S	CH
C104, 106	ECC-D05100F	10pF 50WV $\pm 1\text{pF}$ Ceramic	2	2				
C11	ECC-D05150K	15pF 50WV $\pm 10\%$ Ceramic	1	1				
C1, 14	ECC-D05180K	18pF 50WV $\pm 10\%$ Ceramic	2	2				
C32	ECC-D05470K	47pF 50WV $\pm 10\%$ Ceramic	1		1			
C91, 92	ECC-D05101K	100pF 50WV $\pm 10\%$ Ceramic	2			2		
C2, 4, 13	ECC-D05102MY	0.001 μ F 50WV $\pm 20\%$ Ceramic	3	3				
C8, 18, 19, 21, 22	ECC-D05103MY	0.01 μ F 50WV $\pm 20\%$ Ceramic	5	1	4			
C55, 93, 94, 97, 98	ECC-D05103ZV	0.01 μ F 50WV $+80\%$ -20% Ceramic	5		1		4	
C10, 16, 105, 25, 35, 52, 17, 108, 109	ECC-D05203ZV	0.022 μ F 50WV $+80\%$ -20% Ceramic	9	3	6			
C27, 31	UKD-12J223M	0.022 μ F 50WV $\pm 20\%$ Ceramic	2		2			
C101	BP-21	100pF 1400WV $+100\%$ -0% Ceramic	1					1
C37	ECQ-S05121JZ	150pF 50WV $\pm 5\%$ Styrol	1		1			
C6	ECQ-S05181KZ	180pF 50WV $\pm 10\%$ Styrol	1	1				
C24, 46	ECQ-S05152KZ	1500pF 50WV $\pm 10\%$ Styrol	2		2			
C43	ECQ-S05182JZ	1800pF 50WV $\pm 5\%$ Styrol	1		1			
C23, 33	ECQ-S05271JZ	270pF 50WV $\pm 5\%$ Styrol	2		2			
C40, 44	ECQ-S05472KZ	4700pF 50WV $\pm 10\%$ Styrol	2		2			
C47, 48	ECQ-M05222MZ	0.0022 μ F 50WV $\pm 20\%$ Polyester	2		2			
C42, 56, 57	ECQ-M05103MZ	0.01 μ F 50WV $\pm 20\%$ Polyester	3		1	2		
C39	ECQ-M05153MZ	0.015 μ F 50WV $\pm 20\%$ Polyester	1		1			
C45	ECQ-M05223MZ	0.022 μ F 50WV $\pm 20\%$ Polyester	1		1			
C68, 69	ECQ-M05563MZ	0.056 μ F 50WV $\pm 20\%$ Polyester	2			2		
C70, 72	ECQ-M05683MZ	0.068 μ F 50WV $\pm 20\%$ Polyester	2			2		
C75, 78	ECE-A6V10N	10 μ F 6.3WV Electrolytic	2			2		
C26, 58, 61, 86, 87	ECE-A6V33N	33 μ F 6.3WV Electrolytic	5		1	4		
C84, 85, 103	ECE-A6V47N	47 μ F 6.3WV Electrolytic	3	1		2		
C36, 88, 89, 100	ECE-A6V220N	220 μ F 6.3WV Electrolytic	3		1	2	1	
C110	ECE-10V33N	33 μ F 10WV Electrolytic	1			1		
C51, 80, 83, 100	ECE-A10V220N	220 μ F 10WV Electrolytic	4		1	2	1	
C59, 60	ECE-A10V470N	470 μ F 10WV Electrolytic	2			2		
C62, 63, 66, 67, 81, 82	ECE-A16V3R3N	3.3 μ F 16WV Electrolytic	6			6		
C41, 102	ECE-A16V4R7N	4.7 μ F 16WV Electrolytic	2		1	1		
C51	ECE-A16V47N	47 μ F 16WV Electrolytic	1		1			
C90, 99	ECE-A16V470N	470 μ F 16WV Electrolytic	2			1	1	
C49	ECE-A25V1N	1 μ F 25WV Electrolytic	1		1			

REPLACEMENT PARTS LIST (Cont'd)

REF. NO.	PART NO.	DESCRIPTION	PER SET (pcs.)	REMARKS				
				RF	IF	AF	P.S	CH
C34	ECE-B16V4R7N	4.7 μ F 16WV Electrolytic	1		1			
C95, 96	ECE-B16V2200	2200 μ F 16WV Electrolytic	2				2	
C64, 65	AL-10V0.1M	0.1 μ F 10WV Electrolytic	2			2		
C74, 77	AL-10V0.15M	0.15 μ F 10WV Electrolytic	2			2		
C71, 73	AL-10V0.22M	0.22 μ F 10WV Electrolytic	2			2		
C76, 79	AL-10V0.68M	0.68 μ F 10WV Electrolytic	2			2		
VARIABLE RESISTORS								
VR1, 2	EVG-K1AL35B54	50k Ω Loudness Control	1					
VR3	EVC-B2AL35G15	100k Ω Balance Control	1					
VR4, 5	EVF-N0AL35B54	50k Ω Treble Control (Left & Right)	1					
VR6, 7	EVF-N0AL35B54	50k Ω Bass Control (Left & Right)	1					
VR8 (R37)	EVL-S0AA00B13	1k Ω FM Separation Adjust	1					
VARIABLE CAPACITORS								
CT1, 2, 4	ECV-5XR27B18S	Tuning Capacitor	1					
CT3, 5	ECV-1ZW10P12	Trimmer Capacitor	2					
SWITCHES								
S1	ESR-E245F30AE	Band Selector Switch	1					
S2	EVQ-B0GL30	AFC Switch	1					
S3	SSH-10	Power Switch Ass'y	1					
SPEAKERS								
SP1~2	EAS-16P24SF	16 cm PM Dynamic Speaker, 16 Ω	2					
MISCELLANEOUS								
	SXE-18	Stay Mechanism Assembly	1					
	XAN43T	Dial Light	2					Old Part No. : SVL-205
	XAN37T100	"Stereo" Light	1					Old Part No. : RVL-212-2
	SHG-950	Rubber Holder, "Stereo" Light	1					
	SDD-96	Dial Pointer	1					
	SDH-98	Back Plate, Dial	1					
	RDD-60-3	Dial Drum	1					
	RDS-414	Drum Spring	2					
	RDR-14	Pulley D, Dial	8					
	SDT-1242	Tuning Shaft	1					
	SDE-8	Shaft Assembly, Selector Switch	1					
	SME-44	Shaft Connector, Selector Switch	1					
	SR-3P-4	Bushing	1					
	SWJ-30	Pickup Input Cable	1					

EXPLODED VIEW OF CABINET



REPLACEMENT PARTS LIST (Cont'd)

REF. NO.	PART NO.	DESCRIPTION	PER SET (pcs.)	REMARKS
	SYK-67	AC Primary Power Lead (with Stay)	1	New
	SWJ-36	AC Primary Power Lead	1	New
	SWJ-28	Speaker Lead	1	
	SWJ-34	Changer AC Power Lead	1	
	RJP-5	Pin Plug	6	
	SJJ-62	Pin Jack A, Input/Output	1	
	SJE-64	Pin Jack B, Speaker	1	
	SJE-66	Pin Jack C, Chassis	2	
	SBL-9024	Pivot	8	
	SUS-56	Stay Spring A, Right	2	
	SUS-58	Stay Spring B, Left	2	
	SUS-60	Stay Spring C, Bottom	3	
	SHG-318	Cushion Rubber (L), Amp. Box	2	
	SHG-320	Cushion Rubber (S), Amp. Box	2	
	SHG-314	Rubber Leg, Bottom Cover	4	
	SHR-208-1	PE Leg, Bottom Cover	2	
	XSN3+6R	Screw, Chassis M'tg	6	
	XSN3+10RS	Screw	3	
	XSN3+12	Screw, Rubber Leg	6	
	SQx-5362	Instruction Book	1	New
APPEARANCE				
	SYK-702	Top Cover, Complete	1	New
	SHE-14	Screw, Top Cover	2	
	SYU-162	Bottom Cover Assembly	1	New
	SYK-704	Main Cabinet, Complete	1	New
	SYK-666	Side Panel, Complete (right)	1	
	SYK-668	Side Panel, Complete (left)	1	
	SYK-706	Speaker Cabinet, Complete without Speaker	1	New
	SGX-506	Trim A, Main Cabinet, Top	1	
	SGX-508	Trim B, Main Cabinet, Bottom	1	
	SGX-510	Trim A, Speaker System	4	
	SGX-512	Trim B, Speaker System, Right	4	
	SGX-514	Trim C, Speaker System, Left	4	
	SKD-2560	Dial Plate	1	New
	SBN-298	Knob, Tuning	1	
	SBN-300	Knob, Band Selector	1	

REPLACEMENT PARTS LIST (Cont'd)

REF. NO.	PART NO.	DESCRIPTION	PER SET (pcs.)	REMARKS
	SBN-302	Knob, Volume & Tone Control	4	
	SBN-342	Knob, Power Switch	1	
	SGW-2046	Escutcheon Assembly	1	
	SKF-1400	Bottom Cover	1	
	SGK-312	Panel Assembly	1	New

REF. NO.	PART NO.	DESCRIPTION	
CABINET			
1	SKM-2360	Top Cover, Amp. Box	Top Cover, Complete (Amp. Box) (SYK-702)
2	SGS-196	Dirt Protector Sheet	
3	SGK-258	Jack Indicator Label	
4	* SHE-14	Screw, Top Cover	Bottom Cover, Complete (Amp. Box) (SYU-152)
5	SKF-1200	Bottom Cover, Amp. Box	
6	SUW-400	Holder (Back), Top Cover	
7	SUW-402	Holder (Side), Top Cover	
8	* SHG-318	Rubber A (L), Cushion	
9	* SHG-320	Rubber B (S), Cushion	Main Cabinet, Complete (SYK-704)
10	SKM-2380	Main Cabinet	
11	SGK-312	Panel Assembly	
12	* SGX-506	Trim A, Top	
13	* SGX-508	Trim B, Bottom	
14	RGB-2	N Badge	
15	SGW-2046	Escutcheon Assembly	
16	SYK-666	Side Panel, Complete (Right)	
17	SYK-668	Side Panel, Complete (Left)	
18	SYK-706	Speaker Cabinet, Complete without Speaker & Speaker Cord	
19	SYK-1400	Bottom Cover	

Note: Replacement parts without "*" mark are to be ordered in the form of assembly.